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October 25, 2005

Mary L. Cottrell, Secretary
Department of Telecommunications and Energy
One South Station, 2nd Floor
Boston, MA 02110

RE: D.T.E. 04-116- Investigation by the Department of Telecommunications and Energy On Its Own Motion Regarding the Service Quality Guidelines Established in Service Quality Standards for Electric Distribution Companies and Local Gas Distribution Companies, D.T.E. 99-84 (2001)

Dear Secretary Cottrell:

Please find attached the responses of Boston Edison Company, Cambridge Electric Light Company, Commonwealth Electric Company, d/b/a NSTAR Electric and NSTAR Gas Company (together with NSTAR Electric, "NSTAR") to the Sixth Set of Information Requests asked by the Department of Telecommunications and Energy to the Electric Companies in the above-referenced proceeding.

Please contact me, Cheryl Kimball or Kerry Britland at NSTAR if you have any questions regarding the filing.

Very truly yours,

John K. Habib

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Enclosure
cc: Service List
Jody Stiefel
Joseph Rogers, Assistant Attorney General

Information Request DTE-LDC 6-1

As an alternative to mandatory inspection and maintenance guidelines, please identify new Service Quality performance measures to realize the effective maintenance of your system?

Response

NSTAR Electric is not aware of any "new" service-quality performance measures that would provide a better indication of the effectiveness of the Company's inspection and maintenance practices than is provided by the existing SAIDI and SAIFI metrics.

As NSTAR Electric stated at the technical session (see Tr. 2, at 310, 317), the "effective maintenance" of an electric system is an input to system performance and is not appropriate (or susceptible) to measurement as a performance metric under the Department's SQ Plan. The focus and intent of the Department's service-quality measurement system is to measure the Company's performance in *providing service* to customers. To accomplish this objective, the Department has established a comprehensive system to quantify, measure and track the Company's performance in terms of the customer's experience, which is determined by the level of electric reliability, responsiveness to customer calls, responsiveness to gas odor calls, timeliness of meters read and resolution of billing issues. The SAIDI and SAIFI metrics are specifically designed to measure the level of reliability in electric service. Electric companies cannot perform well in relation to those metrics if they are not keeping up with inspection and maintenance practices. Therefore, the SAIDI/SAIFI metrics appropriately gauge the "effectiveness" of the Company's maintenance practices by measuring the reliability of the service provided to customers.

In fact, the effectiveness of inspection and maintenance activities is not susceptible to objective quantification and measurement *unless measured in terms of system performance*. Each of the electric companies serve systems that are geographically distinct, with differing customer demographics and differing system configurations, design standards and equipment requirements. In addition, each electric company operates with differing work-rule obligations for field personnel. As a result, the inspection and maintenance practices of one company may differ in myriad ways from those of another company. In addition, a company's inspection and maintenance practices are continually evolving to accommodate changes in technology and to incorporate new best practices and for a number of other factors. As a result, the system's performance at any given time is not a function of a single set of inspection guidelines and practices, which can be measured for "effectiveness." The development and implementation of inspection and maintenance programs is a fluid and iterative process that occurs over time. As a result, the only way to gauge the effectiveness of those practices is to measure the resulting performance of the system over time. This is exactly what the SAIDI/SAIFI metrics are designed to accomplish.

Therefore, as opposed to measuring "inputs," the Department's future SQ Guidelines should continue to require companies to measure "outputs," which is the level of service provided to customers. By reviewing a company's most recent annual SAIDI and SAIFI performance and comparing it to the company's historical performance, the Department is able to determine whether a company's electric reliability has degraded over time, potentially signaling the need for a change in inspection and maintenance schedules or practices. Short of that, no action by the Department is appropriate or warranted at this time.

Information Request DTE-LDC 6-2

Using the Company's available historical outage information, please provide, in an active excel spreadsheet, a calculated required minimum number of customers affected to quality for exclusion under IEEE-1366, and the associated values of α (Alpha), β (Beta), T_{med}, SAIDI, and total customer minute interruption for the years 2000, 2001, 2002, 2003 and 2004, for each of the following assumed interruption durations: 1 minute, 5 minutes, 60 minutes, 360 minutes, 720 minutes, 1,440 minutes and 2,880 minutes.

Response

Please see Attachment DTE-LDC-6-2.

Attachment
DTE-LDC-6-2

NSTAR
DTE 04-116, DTE-LDC 6-2

	Threshold Calculation							Number of Customers affected at following durations to qualify for exclusion under IEEE-1366:						
	col A	col B	col C	col D	col E									
	Mean	Std. Dev	col B x 2.5	col A + C	T MED	Annual SAIDI	Minutes of Interruption	1 min.	5 min.	60 min.	360 min.	720 min.	1440 min.	2880 min.
2002	-2.053	1.517	3.792	1.739	5.694	89.26	95,006,880	6,060,000	1,212,000	101,000	16,900	8,500	4,300	2,200
2003	-2.123	1.539	3.847	1.723	5.603	91.68	100,547,160	6,150,000	1,229,000	102,500	17,100	8,600	4,300	2,200
2004	-2.147	1.544	3.860	1.713	5.545	75.13	83,073,060	6,130,000	1,226,000	102,200	17,100	8,600	4,300	2,200

Information Request DTE-LDC 6-3

Regarding line loss, each electric company indicated that line loss was equal to the difference between energy requirement and energy sold, and that the loss includes various components such as actual system loss, theft, etc. Please list all the various components that your Company includes in reporting line loss, and briefly describe why each component in included in the line loss.

Response

The line loss factors reported to FERC include technical losses (load and no-load losses), station service, theft of current, and other unaccounted for energy losses.

Technical losses are inherent thermal heating losses that occur naturally in the process of transforming and distributing electricity. These losses occur from installed plant, such as wires, transformers and other equipment, and include resistive "load" losses through copper and aluminum conductors and transformer windings, and "no load" losses caused by transformer magnetization. These technical losses are the aggregated total of all load and no-load losses system-wide, including the Companies' portions of the 345kV and 115kV transmission system, all bulk substation and distribution transformation, and all levels of the distribution system down to the point of common coupling between NSTAR Electric and its customers.

Station service losses include those loads used for the Companies' own usage that are necessary and adjunct to operating a transmission and distribution system. These may be metered or unmetered. Station service loads generally include: (1) substation yard lighting; (2) control house and circuit breaker cubicle lighting and heating; (3) battery charging; (4) power for transformer load tap changer (LTC) controls; (5) power for transformer cooling fans and pumps; (6) power supply for protective relaying systems; and (7) power supplies for cathodic protection systems.

Theft of current is defined as energy used, but not metered, and therefore is a component of total line loss. Theft occurs when energy is diverted away from the meter or the meter is tampered so as not to register the full amount of energy usage. The Companies takes steps to seek out and eliminate theft situations, and actively investigates its accounts and meter readings to determine potential for theft.

Other unaccounted-for energy includes losses as a result of connection points that are undermetered or unmetered due to equipment malfunction, and "meter alives". Equipment malfunctions can result in meter readings that show far less usage than the actual energy consumed. "Meter Alives" arise when an existing customer terminates their service with NSTAR Electric and a new customer does not immediately take over the service. Unless the meter is shut off the exact day the customer terminates service, the service remains energized with no customer of record and any usage that occurs cannot be charged to any customer. Therefore, it is part of the Companies' line loss calculation.

Information Request DTE-LDC 6-4

Regarding line loss, please describe:

(a) how the distribution and transmission loss factors that are reported to ISO-NE for the load settlement process are determined, include all supporting documents and a copy of the most recently reported loss factors for each voltage level;

(b) how often the distribution and transmission loss factors reported to ISO-NE are updated;

(c) what steps the Company currently takes to reduce its loss factors, and what steps the Company plans to take in the future to reduce its loss factors;

(d) how the Company benefits, if at all, from reducing its loss factors;

(e) what steps the Department could take to reduce loss factors;

(f) for what purposes, other than load settlement, the Company uses its loss factors, describe each purpose and provide any supporting documents.

Response

a) The transmission and distribution ("T&D") loss factors that are reported to ISO-NE for the load settlement process are determined as follows. To obtain a Loss Factor, the algorithm is to divide Sales by Sales plus Losses. Loss Factors adjust sales at one voltage level to their equivalent at a higher voltage level. The annual load and no-load losses due to sales are broken down into hourly load and no-load losses. Load research data provides information about hourly sales data by voltage level. The hourly no-load and load losses due to sales at the four main voltage levels (Transmission 115kV and over, High Tension 13.8kV and 24 kV, Primary 4kV and Secondary 600 volts and under) are added together to obtain hourly total losses for the year by voltage level. The hourly losses and sales are segregated into monthly and seasonal groups. For each group, the total loss and the losses at the time of the non-coincident peak ("NCP") for the sales at each voltage level, and at the time of the system peak ("CP") are extracted. Using these figures, the monthly and seasonal energy, NCP and CP loss factors, and Percent Marginal Losses are calculated on an on-peak, off-peak and entire rating period basis.

b) Subsequent to the completion of line loss studies, the distribution and transmission loss factors reported to ISO-NE were updated for Boston Edison in 1992 and for Commonwealth Electric and Cambridge Electric in 1995. In 2002, the Companies' FERC Form 1 losses were validated, and broken out by transmission, substation and distribution components, via a streamlined in-house investigation. In 2005, work has been initiated to update the Companies' loss factors by voltage level. It is expected that this study will be completed in 2006.

c) As discussed below, NSTAR Electric has taken steps to reduce technical line loss, theft, metering and other unaccounted for losses.

- For technical line losses, the Companies from time to time conduct capacity assessments of its transmission and distribution supply system. These assessments are conducted in support of an internal 10-year plan review, as well as the Companies' annual Planning Report filed with the Department pursuant to D.T.E. 98-84 /EFSB 98-5. The assessments are also discussed in the ISO-NE Regional System Plan ("RSP"). These capacity assessments identify supply deficiencies that may exist under normal conditions and during reasonably foreseeable contingency events that are described in the Companies' reliability criteria and design guidelines.

  These studies are taken into consideration when identifying T&D upgrade projects, such as transmission line, distribution substation and feeder upgrades and additions that serve to remedy the identified deficiencies. The process of upgrading T&D infrastructure to serve increased load growth, interconnect new customers or generators, and address reliability concerns has a net effect of reducing technical losses. Upgrade projects generally include the addition and/or upgrading of new transmission and distribution lines and construction of new substations which can result in shorter and/or more efficient circuits, which serve to reduce losses while permitting the Companies to serve increased load levels.

  Two recent examples of infrastructure projects that will have an effect of reducing technical losses are the 18-mile 345kV transmission line project being constructed in 2005-2006 between Stoughton and Boston, which will significantly reduce line loss at the transmission level simply as a result of carrying the electrical load on that line at 345kV versus 115kV. Another project that will result in reduced losses is the new Colburn Street Substation. This substation is adding capacity, and its location allows for new and shorter distribution circuits, which directly reduces line losses.

- Theft of current losses is reduced through the work of the Companies' Revenue Protection Department. The department actively utilizes both internal and external information resources, including statistical data analysis of usage patterns and demographic information relative to customers or businesses and typical usage levels, to identify and recover revenue from service locations, individuals and companies that are illegally utilizing energy without benefit of proper metering or where a metering malfunction exists. Additionally, field personnel are trained to detect and identify discrepancies in metering or other unusual circumstances that would indicate theft or a defective meter. For those service locations where defective, missing, or bypassed metering is found, the service or metering situation is corrected, and customer billing can be back-billed to account for the energy difference. For those locations where theft and diversion of current are found, the customer can be back-billed and assessed late payment fees and criminal or civil charges can also be brought.

- Inaccurate meter reading devices is a source of loss. As legacy electromechanical meters age, they can register lower than actual usage. In the past two years, NSTAR Electric has replaced over 170,000 meters with solid state devices as a part of our Automated Meter Reading project. This project reduces metering equipment losses, and greatly improves the accuracy of meter reads especially for many indoor and other difficult-to-access metering locations.

- Unbilled usage due to transitions in billing customers accounts for some of the total system loss. Internal policies have been strengthened to disconnect energy service to commercial customer locations vacated but without a newly established tenant. For residential customers, policies have been strengthened. In the NSTAR Electric territory there is a large turnover of residential accounts in June and September with the closing and opening of the many colleges and universities. In these areas NSTAR Electric has traditionally utilized a "meter alive" process whereby usage in-between customers is monitored and minimum levels of usage is tolerated, (i.e., empty refrigerators left on in an apartment). NSTAR Electric has reduced its level of usage tolerance in 2005 so that meters are disconnected sooner to minimize customer transition losses.

d) The Companies benefits from reducing line loss factors in multiple ways. First, the Companies' efforts to reduce our technical losses through infrastructure improvements, equipment losses through our deployment of automated meter reading solid state equipment, theft of current instances through enhanced detection, and customer billing account transition losses through tighter management controls and policies are a source of corporate empowerment that impresses on employees the value of our service and our attention to proper business management.

e) The Department could take steps to reduce loss factors through a policy change to allow distribution companies to back-bill customers for usage from the time they occupy a premise and being to receive energy, versus the current policy which holds customers accountable for paying for usage from the time they call the utility to associate their billing information with the service location.

f) The Companies' electric and gas Load Forecasting Department uses loss factors in the development of the peak forecast each year. The total forecasted megawatt-hour retail sales are grossed up for losses in order to produce a forecast of output upon which the peak (demand) forecast is based.

The Companies also uses line loss factors to calculate the monthly unbilled sales for financial reporting purposes. The unbilled sales for the month represent sales delivered to customers, but not yet billed. The calculation involves subtracting an assumed line loss from the total territory load delivered for the month and comparing that result to billed sales for the month. The underlying loss factors for the unbilled calculation are the same as the loss factors used for ISO-NE reporting (see Attachment LDC-DTE-6-4).